What is claimed is:

1. An apparatus for cutting, at an appropriate length, a cylindrical paper pipe serving as a core, around which a long recording material is wound successively in a widthwise direction perpendicular to a winding direction of the recording material, the apparatus comprising:

a cutting mandrel, which is insertable into the paper pipe such that its outer peripheral surface comes into contact with an inner surface of the paper pipe;

a disc-shaped cutting blade positioned opposite to the outer periphery of the paper pipe and having a cutting edges at its circumference;

a ring-shaped groove formed on the cutting mandrel so as to correspond to a cutting position of the cutting blade in the axial direction of the cutting mandrel:

a rotating device for rotating the paper pipe, which is supported by the cutting mandrel; and

a cutting blade rotating device for rotating the cutting blade, wherein a difference between linear rotation velocities of the paper pipe rotating device and the cutting blade rotating device is controlled within a certain range.

2. The apparatus according to claim 1, further comprising a cutting mandrel rotating device, wherein the linear rotation velocity controller controls the respective rotational linear velocities of the cutting mandrel rotating device, the paper pipe rotating device and cutting blade rotating device to be within a certain range.

3. The apparatus according to claim 1, further comprising a pair of rotating members positioned opposite to each other at inner and outer cutting surfaces of the

paper pipe cut with the cutting blade, wherein one rotating member rotates in an opposite direction relative to that of the other rotating member and said rotating members have tapered cutting surfaces for smoothing and removing burrs formed on an inner periphery of the paper pipe.

4. The apparatus according to claim 1, further comprising a main stage and a standby stage mounted adjoiningly to the main stage, wherein the standby stage includes a rail section and a carrier supported thereto, wherein the carrier is guided along the rail section, so that the standby stage is movable toward or away from the main stage, and wherein the cutting mandrel is attached to the carrier.

5. The apparatus according to claim 1, wherein the rotational linear velocities of the cutting blade and the paper pipe are controlled to be equal.

6. The apparatus according to claim 2, wherein the paper pipe rotating device and the cutting mandrel rotating device are rotated by a common driving source.

7. The apparatus according to claim 4, wherein the cutting mandrel is positioned coaxially corresponds with the axis of the paper pipe supported on a supporting portion included in the main stage.

8. The apparatus according to claim 7, wherein the paper pipe rotating device includes a driving chuck unit provided on the main stage opposite to the standby stage, wherein the driving chuck unit includes a holder section for holding an end of the paper pipe and a leading edge of the cutting mandrel approaches the paper pipe from the

standby stage.

9. The apparatus according to claim 8, wherein the driving chuck unit includes a driving section and the holder section holds the cutting mandrel and the paper pipe to be rotatable by a driving force of the driving section.

10. The apparatus according to claim 8, wherein a rail section is mounted at the main stage from the standby stage to the driving chuck unit, wherein a cutting unit is supported on the rail section, said cutting unit being configured such that it is guided along the rail section and movable from the standby stage to the driving chuck unit, and the cutting blade is fixed upon the cutting unit.

11. The apparatus according to claim 10, wherein a rotational axis of the cutting blade is parallel to axes of the held cutting mandrel and the paper pipe, and is rotatable by the driving section of the cutting unit.

12. The apparatus according to claim 10, wherein the cutting unit is moved along the rail section at intervals and, at respective positions, is moved toward or away from the paper pipe, and depending upon the intervals of the cutting unit, the width of a groove formed on the cutting mandrel ranges between 0.1 mm and 1.0 mm.

13. The apparatus according to claim 11, wherein a thickness-wise dimension of the cutting blade from a central axis is formed so as to be thicker than a thickness-wise dimension of the periphery edge formed by a blade.

14. The apparatus according to claim 12, wherein the width of the groove ranges between 0.2 mm and 0.6 mm.

15. The apparatus according to claim 12, wherein the groove is formed by being carved to a depth corresponding to the cutting mandrel.

16. The apparatus according to claim 12, wherein the cutting mandrel comprises a main pipe and a plurality of mandrel pieces sequentially inserted around the main pipe, each mandrel piece having a mortar-shaped recess on its edge and a circular protrusion, and when the mandrel pieces are sequentially inserted around the main pipe, the leading tips of the protrusions come in contact with each other so that a gap, which serves as the groove, is formed at the outer peripheral ends of the mandrel pieces.

17. The apparatus according to claim 14, wherein the width of the groove ranges between 0.3 mm and 0.5 mm.

18. A method for cutting a cylindrical paper pipe serving as a core, around which a long recording material is wound in layers, in a widthwise direction perpendicular to a winding direction of the recording material, said paper pipe cut to an appropriate length, the method comprising :

rotating a disc-shaped cutting blade such that a cutting mandrel is inserted into the paper pipe with an inner periphery of the paper pipe contacting an outer periphery of the cutting mandrel; and

upon cutting at an axial position of the paper pipe, the paper pipe is cut while being rotated in such a manner that the difference between rotational linear velocities of

the paper pipe and the cutting blade is controlled within a certain range.

19. The method according to claim 18, further comprising forming a ring-shaped groove on the cutting mandrel corresponding to the cutting blade, wherein the groove is formed such that inteference between cutting edges of the cutting blades and the cutting mandrel is avoided when cutting.

20. The method according to claim 18, further comprising controlling the rotational linear velocities of the cutting blade and the paper pipe so as to be equal.